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31. A paste-like mass that can be used in electrochemical elements, comprising a heterogeneous mixture of:

a matrix containing or comprising at least one of the group consisting of organic polymer, precursors thereof, and prepolymers thereof;

one of: a liquid inorganic or largely inorganic electrode material that does not dissolve said matrix or essentially does not dissolve said matrix, or such an electrolyte, or such an ionic or electronic intermediate conductor between two adjacent electrolytes/electrodes that can be arranged in an electrochemical element, wherein the electrolyte can contain up to 70 vol. % organic solvent, relative to the total quantity of solvent used, said solvent being miscible with water; and

if required, a powdery solid that is essentially inert relative to the electrochemically activatable liquid.

32. A paste-like mass in accordance with claim 31, wherein said matrix also contains at least one of plasticizer and a solvent or swelling agent.

33. A paste-like mass in accordance with claim 31, wherein said matrix is or contains a cross-linkable liquid or soft resin.

34. A paste-like mass in accordance with claim 31, wherein said matrix contains or comprises at least one organic polymer that is at least partially dissolved or swollen in a solvent or swelling agent, and wherein said organic polymer is selected from among synthetic polymers and natural polymers and mixtures thereof.

35. A paste-like mass in accordance with claim 31, wherein a hygroscopic salt is furthermore worked into said matrix material.

36. A paste-like mass in accordance with claim 31, wherein said liquid is an aqueous or anhydrous, inorganic or largely inorganic liquid and contains at least one of undissolved solid electrolytes, a mixed conductor, and electrolyte material.

37. A paste-like mass in accordance with claim 31, wherein said inorganic liquid contains magnesium chloride.

38. A self-supporting layer or layer that is placed upon a substrate, comprising a heterogeneous mixture of:

a matrix containing or comprising at least one of the group consisting of organic polymer, precursors thereof, and prepolymers thereof;

one of: a liquid inorganic or largely inorganic electrode material that does not dissolve said matrix or essentially does not dissolve said matrix, or such an electrolyte, or such an ionic or electronic intermediate conductor between two adjacent electrolytes/electrodes that can be arranged in an electrochemical element, wherein the electrolyte can contain up to 70 vol. % organic solvent, relative to the total quantity of solvent used, said solvent being miscible with water; and

if required, a powdery solid that is essentially inert relative to the electrochemically activatable liquid.

39. A composite layer with electrochemical properties, comprising:

a flexible layer containing an organic polymer, said layer containing material suitable for positive electrodes;

a layer in accordance with claim 38, wherein (B) is an electrolyte; and

a flexible layer containing an organic polymer, said layer containing a material suitable for negative electrodes.

40. A composite layer with electrochemical properties, comprising:

a layer in accordance with claim 38, wherein (B) is selected from the group of cathode and anode materials;

a flexible layer that contains a solid electrolyte embedded in an organic polymer matrix; and

a flexible layer that contains liquid or solid electrode material embedded in an organic polymer matrix, wherein said electrode material can be the counter-electrode of said electrode material of said layer (1).

41. A composite layer with electrochemical properties in accordance with claim 39, wherein also applied to said layer with positive electrode material is a layer acting as a lower contact electrode, and to said layer with negative electrode material is a layer acting as an upper contact electrode.

42. A composite layer with electrochemical properties in accordance with claim 40, wherein also applied to said layer with positive electrode material is a layer acting as a lower contact electrode, and to said layer with negative electrode material is a layer acting as an upper contact electrode.

43. A composite layer in accordance with claim 40, wherein said cathode material is a salt, preferably a lithium salt, dissolved in a proton-separating solvent, preferably H_2O, and said anode material is

an aprotic material.

44. The use of said composite layer of claim 39 in a primary battery, secondary battery, or decomposition battery.

45. The use of said composite layer of claim 40 in a primary battery, secondary battery, or decomposition battery.

46. The use of at least one layer in accordance with claim 38 in a low-temperature fuel cell, in solar cells, or in electrochemical sensors, in particular in an electrochemical sensor for measuring moisture.

47. A method for producing a paste-like mass in accordance with claim 31, wherein a cross-linkable pre-polymerisate is combined and mixed thoroughly with said liquid electrode material, electrolyte, or intermediate conductor and with said solid, if any.

48. A method for producing a paste-like mass in accordance with claim 31, wherein said organic polymer, precursors thereof, or prepolymers thereof are combined with a plasticizer and said solid, if any, and thoroughly mixed, whereupon a solvent is added in which mainly said plasticizer dissolves, wherein said plasticizer dissolved in said solvent is then washed out of said mass and any solvent is removed from said mass, and finally said liquid electrode material or said liquid electrolyte or said intermediate conductor is added.

49. A method for producing a self-supporting layer or layer that is placed upon something in accordance with claim 38, including the step of using for said paste-like mass a mass whose matrix comprises a cross-linkable polymer or prepolymer and said layer produced from said paste-like mass is then subjected to cross-linking of said polymer components, which cross-linking is effected by electron

radiation or by heating or by immersing said layer in a chemical cross-linking agent.

50. A method for producing a self-supporting layer or layer that is placed upon something in accordance with claim 38, wherein a paste-like mass is produced that comprises a heterogeneous mixture of at least one organic polymer, precursors thereof, or prepolymers thereof, a plasticizer, and a solvent or swelling agent, and a powdery solid, if required, or that contains these components, wherein said paste-like mass is then converted into the desired layer form and said form is solidified by evaporating the solvent or swelling agent and any additional measures, wherein a solvent for the plasticizer is then used for extracting the latter from the solidified layer, and finally the cavities that result therefrom are filled by immersing in with a liquid inorganic or largely inorganic electrode material that does not dissolve said organic matrix or essentially does not dissolve said matrix, or such an electrolyte, or such an ionic or electronic intermediate conductor between two adjacent electrolytes/electrodes that can be arranged in an electrochemical element, wherein said electrolyte can contain up to 70 vol. % organic solvent, relative to the total quantity of solvent used, said solvent being miscible with water.

51. A method in accordance with claim 50, wherein said liquid electrode material is a salt dissolved in a solvent that is at least partially organic and in that once said cavities have been filled, the organic components of said solvent are extracted and replaced with an inorganic component, preferably H_2O.

52. A method for producing a composite layer in accordance with claim 39, wherein each paste-like mass provided for a layer is

successively applied to a substrate using a paste application method, particularly preferably using a pressure method, and said layers are then brought into their final solidified state.

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53. A method for producing a composite layer in accordance with claim 40, wherein each paste-like mass provided for a layer is successively applied to a substrate using a paste application method, particularly preferably using a pressure method, and said layers are then brought into their final solidified state.